

Moisture Resistant Primer for Composite Bonded Repairs, Phase II

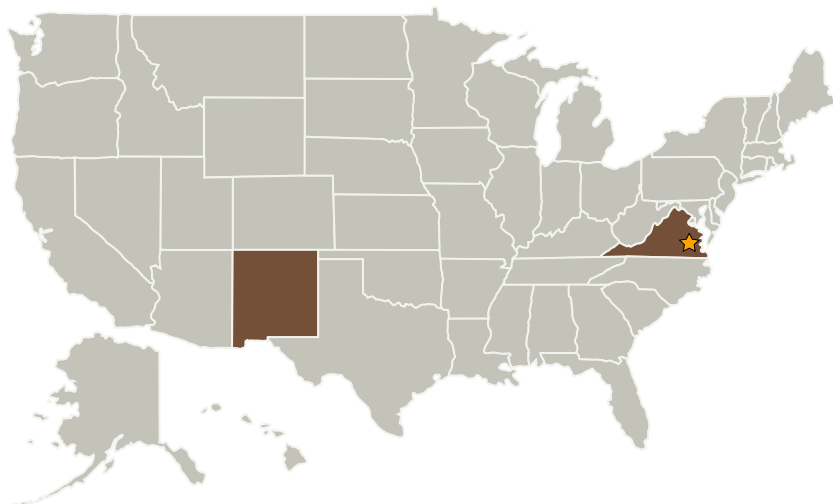
Completed Technology Project (2009 - 2011)



Project Introduction

Aging and durability of aircraft in both the military and civilian sectors are becoming major issues as the existing fleet continues to age. Additionally, the increased use of composite structures in the civilian fleet, such as in the Boeing 787 Dreamliner and the Airbus A380, make the understanding and/or improvement of composite durability, particularly durability of repairs, even more critical. Several areas have been identified as targets for improvement in composite aircraft repair. These include the development of rapid, low temperature repair methods and associated materials as well as development of the quality of repairs when they are made. Adhesion of bonded repairs is one area that needs to be addressed. In the Phase I program Adherent Technologies, Inc. demonstrated a novel moisture-resistant primer system for use in repairs of standard carbon/epoxy composites used in many subsonic aircraft. Our proprietary chemistry comprised of a reactive coupling agent and a carrier resin compatible with standard aerospace epoxy resins bonds directly to the prepared aircraft composite surface while retaining residual functionality that can be cured directly into the matrix of the repair leading to a covalently bound repair, thereby strengthening the repair interface. An increase in bond strength for primed samples relative to unprimed control specimens was noted; the improvement in the fracture toughness of the bonds was particularly of note. The Phase II effort will focus on the optimization of these primer systems and associated application and activation methods. Water-based systems will also be developed and demonstrated.

Primary U.S. Work Locations and Key Partners



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Langley Research Center (LaRC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★ Langley Research Center(LaRC)	Lead Organization	NASA Center	Hampton, Virginia
Adherent Technologies, Inc.	Supporting Organization	Industry	Albuquerque, New Mexico

Primary U.S. Work Locations

New Mexico	Virginia
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Project Transitions

**January 2009:** Project Start**July 2011:** Closed out

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX12 Materials, Structures, Mechanical Systems, and Manufacturing
 - └ TX12.1 Materials
 - └ TX12.1.1 Lightweight Structural Materials